TITLE OF THE INVENTION

COGGED BELT AND CONVEYOR WITH COGGED BELT AND ROLLER SUPPORT RAIL

BACKGROUND OF THE INVENTION

This application claims the benefit of U.S. Provisional Application No. 60/397,864, filed July 22, 2002.

The invention relates to conveyor systems, and more particularly to conveyor systems used with construction vehicles.

Conveyors are often used with construction vehicles to transport material, such as paving material, either between different vehicles or to different locations on or off of a single vehicle. One common conveyor application is on a material transfer vehicle or "MTV", which is used to supply paving material to a paving vehicle, specifically between a storage bin or hopper on the transfer vehicle to a storage hopper on the paving vehicle. Further, paving vehicles or "pavers" typically include a conveyor for transporting material from the hopper, typically located at the front of the vehicle, to the rear end of the vehicle so that the material "falls off" the vehicle rear to deposit on a road base. With conveyors used to transport paving material, the conveyor must generally be capable of supporting a relatively heavy mass of material.

SUMMARY OF THE INVENTION

In one aspect, the present invention is a conveyor for transporting material along a centerline. The conveyor comprises a rotatable drive wheel having a circumferential outer surface and a plurality of openings spaced circumferentially about the outer surface. A belt includes an endless body disposed about the drive wheel outer surface and extending generally along the centerline, the body having a generally circumferential outer surface configured to transport material and a generally circumferential inner surface. Further, a plurality of projections extend from and are spaced circumferentially about the belt inner surface, each projection being separately disposable within each one of the wheel openings. As the wheel rotates, at least one projection is disposed within one of the wheel openings such that the wheel drives the belt to circulate generally about the centerline to displace material disposed upon the belt outer surface generally along the centerline.

In another aspect, the present invention is a conveyor for transporting material comprising a drive wheel having a circumferential outer surface and a plurality of openings spaced circumferentially about the outer surface. A belt including an endless body is

disposed about the drive wheel, the belt body having two opposing side edges, a generally circumferential outer surface configured to transport material, a generally circumferential inner surface enclosing an inner perimeter. A plurality of projections extend from the belt inner surface, each projection being separately disposeable within each one of the wheel openings and having an end spaced laterally inwardly from one of the two belt edges. As such, the belt inner surface has a substantially continuous circumferential surface section located generally between the projection ends and the one belt edge. Further, a support rail has a plurality of rollers, the rollers being contactable with the belt continuous surface section such that the rail at least partially supports the belt.

In a further aspect, the present invention is a belt for a material transporting conveyor that includes at least one rotatable drive wheel with an outer surface and a plurality of openings spaced about the outer surface. The conveyor belt comprises an endless body with a longitudinal centerline, two side edges disposed on opposite sides of the centerline, a generally circumferential outer surface configured to transport material and a generally circumferential inner surface enclosing an inner perimeter. A plurality of projections each extend generally from the belt inner surface, each projection being separately disposable within each one of the wheel openings. As the wheel rotates, at least one projection is disposed within one of the wheel openings such that the wheel drives the belt to circulate generally about the centerline to displace material disposed upon the belt outer surface generally along the centerline.

BRIEF DESCRIPTION OF THE DRAWINGS

The foregoing summary, as well as the detailed description of the preferred embodiments of the invention, will be better understood when read in conjunction with the appended drawings. For the purpose of illustrating the invention, there is shown in the drawings, which are diagrammatic, embodiments that are presently preferred. It should be understood, however, that the invention is not limited to the precise arrangements and instrumentalities shown. In the drawings:

Fig. 1 is a side elevational view of two conveyors in accordance with the present invention, one conveyor shown incorporated in a material transport vehicle and the other shown incorporated in a towable conveyor assembly;

Fig. 2 is a partly broken-away, side elevational view of a conveyor assembly in accordance with the present invention;

Fig. 3 is broken-away, bottom plan view of a section of a cogged conveyor belt;

Fig. 4 is a broken-away, enlarged perspective view of the cogged conveyor belt;

Fig. 5 is a side perspective view of a drive wheel of the conveyor assembly;

Fig. 6 is a broken-away, enlarged perspective view of a roller support rail of the conveyor assembly;

Fig. 7 is a broken away, greatly enlarged side cross-sectional view of the belt and one support rail; and

Fig. 8 is a rear view of a frame of the conveyor assembly, shown without the belt and the drive and idlers wheels.

DETAILED DESCRIPTION OF THE INVENTION

Certain terminology is used in the following description for convenience only and is not limiting. The words "upward", and "lower" refer to directions toward and away from, respectively, a designated upper end of a conveyor assembly or a component thereof. The words "inner" "inwardly" and "outer" refer to directions toward and away from, respectively, a designated centerline of the conveyor assembly or of a specified component or axis thereof, the particular meaning intended being readily apparent from the context of the description. Further, the term "circumferential" refers to elements that are oriented so as to be partially or completely extending about a designated center, centerline or axis. In addition, the terms "radial" and "radially-extending" refer to directions generally perpendicular to a designated axis, and refer both to elements that are either partially or completely oriented in a radial direction. Furthermore, the terms "leftward" and "rightward" designate linear directions, and the terms "clockwise" and "counterclockwise" designate angular directions about an axis, as depicted in the drawing figures to which reference is made. The terminology includes the words specifically mentioned above, derivatives thereof, and words or similar import.

Referring now to the drawings in detail, wherein like numbers are used to indicate like elements throughout there is shown in Figs. 1-8 a presently preferred embodiment of a conveyor assembly 10 for transporting material M, preferably used with a construction vehicle 1. The conveyor assembly 10 has a centerline 11 and basically comprises at least one drive wheel 12, an endless belt 14 and at least one support rail 16. The drive wheel 12 is rotatable about a central axis 15, which extends generally perpendicularly through the centerline 11, and has a circumferential outer surface 18 and a plurality of openings 20 spaced circumferentially about the outer surface 18. The wheel 12 also has a plurality of drive surfaces 21, each drive surface 21 at least partially bounding a separate one of the openings 20 and are engageable with the belt 14. The endless belt 14 is disposed about the

drive wheel 12 and has a body 22 with a longitudinal centerline 23, which is substantially collinear with the conveyor centerline 11 when the belt 14 is disposed about the drive wheel 12, as discussed below. Further, the belt body 22 has a generally circumferential outer surface 26 configured to transport material M and a generally circumferential inner surface 28 that partially encloses an interior space S_I. Further, the belt 14 also includes a plurality of projections 30 or "cogs" extending generally inwardly from the belt inner surface 28, such that the belt 14 may be described as "cogged", each projection 30 having at least one contact surface 31 engageable by the drive wheel 12.

More specifically, each projection 30 is separately disposable within each one of the openings 20 of the drive wheel 12, specifically when proximal portions (i.e., proximal to the particular projection 30) of the belt inner surface 28 are disposed generally against the wheel outer surface 18. When one or more projections 30 are each disposed within one of the wheel openings 20, the projection contact surfaces 31 are engaged by the wheel drive surfaces 21, such that angular displacement of the wheel 12 about the axis 15 causes each drive surface 21 to push against and displace the proximal projection 30. The displacement of the projections 30 by action of the rotating drive wheel 12 causes the belt 14 to continuously circulate around and generally along the centerline 23. Thereby, the circulating belt 14 transports any material M deposited on the belt outer surface 26 in either a leftward "L" or rightward "R" generally along a conveyor transport axis 25, which extends along the belt upper surface 26 and generally parallel to the conveyor centerline 11.

Further, the belt inner surface 28 preferably has at least one substantially continuous, substantially smooth "track" surface section 32 disposed between the projections 30 and a proximal one of two side edges 24A or 24B of the belt body 22, as best shown in Fig. 3. The support rail 16 is at least partially disposed within the belt interior space S_I and has a plurality of rollers 34. The rollers 34 are contactable with the belt track surface 32 such that the rail 16 at least partially supports the weight W of the belt 14 and any material M disposed on the belt outer surface 26, as indicated in Fig. 7. Preferably, the support rail 16 includes an elongated body 35 and the rollers 34 are rotatably connected with the body 35.

Furthermore, the conveyor assembly 10 preferably also comprises an elongated frame 38 configured to support the wheel 12, the belt 14 and the support rail 16. The frame 38 has opposing ends 40A, 40B and upper and lower surfaces 66, 68, respectively. Preferably, the drive wheel 12 is rotatably mounted within the frame 38 proximal to the one end 40A, the support rail 16 is mounted to the frame upper surface 66 and the belt 14 extends about the frame upper and lower surfaces 66 and 68. In addition, the frame 38 is preferably configured

to be mounted at an appropriate location on or within a construction vehicle 1, such a material transfer vehicle 2, a towable conveyor 3 or a paving vehicle (not shown), so as to thereby connect the conveyor assembly 10 with the vehicle. Each of the above-discussed basic components of the conveyor assembly 10 is described in further detail below.

Referring now to Figs. 2-4 and 6, the belt body 22 has opposing side edges 24A, 24B and is preferably formed as an integral endless band 42 of a molded polymeric or elastomeric material, such as for example, natural or synthetic rubber. Alternatively, the body 22 may be constructed of two or more sections connected together by appropriate means, such as for example, as two or more elongated elastomeric strips connected by rivets or threaded fasteners, as a plurality of interconnected links, etc. Most preferably, the belt band 42 is generally formed as a "heavy duty" rubber belt having a thickness t_B of between about one inches and two inches between the outer and inner surfaces 26, 28, respectively, as indicated in Fig. 7. As shown in Fig. 4, the belt 14 preferably includes a plurality of transverse ridges 41 (only one shown) extending radially outwardly from the outer surface 26. The ridges 41 function to prevent material M from sliding upon the belt outer surface 26 in directions along the transport axis 25, particularly when the belt 14 is transporting material between different levels or elevations. Further, the belt body 22 also preferably includes a plurality of reinforcing cables 44 disposed within the belt interior 43 (e.g., internally molded) and extending generally longitudinally, which provides increased strength to the belt 14, as is generally known.

As best shown in Fig. 3, the projections 30 are spaced circumferentially about the entire inner perimeter of the belt body 22, such that the projections 30 form an endless "row". Each projection 30 extends transversely across only a central portion C of the belt inner surface 28, i.e., each projection 30 does not extend across the entire width w_B of the belt 14, as indicated in Fig. 3. In other words, each projection 30 has opposing lateral ends 27 spaced laterally inwardly from a proximal one of the two belt edges 27A or 27B. As such, the belt 14 preferably includes both the track surface 32 (discussed above) and another generally continuous track surface 33, the two track surfaces 32 and 33 being located on opposing sides of the belt centerline 23 and the row of projections 30. More specifically, each track surface 33 or 34 is disposed between the plurality of projections 30 and the proximal belt edge 24A, 24B, respectively. Further, each track surface section 33, 34 has a width w_T that is slightly larger than the axial length L_A of each roller 34, and most preferably between about three inches and four inches, so as to be slidable over the rollers 34, as best shown in Fig. 7 and described in further detail below.

Preferably, the projections 30 are generally identically shaped and sized, although the projections 30 may alternatively be formed in two or more different shapes and/or sizes (not shown). More specifically, each projection 30 includes an elongated, generally rectangular or prismatic body 29 connected with the belt body 22, and preferably integrally formed therewith as discussed below. Each cog body 29 has two opposing, generally rectangular contact surfaces 31 extending transversely across the belt inner surface 28 and generally radially with respect to the centerline 23. Preferably, the two contact surfaces 31 of each projection 30 are generally spaced apart by a width w_C sized slightly lesser than the width w_O (Fig. 5) of each wheel opening 20, as discussed below. Further, the projections 30 are preferably spaced from each other by a substantially equal distance d_C (Fig. 3) selected to correspond with the circumferential spacing d_O (Fig. 2) between the drive wheel openings 20. In other words, the cog width w_C and the spacing distance d_C between adjacent projections 30 is such that each projection 30 is configured to enter within a separate wheel opening 20 when proximal portions of the belt 14 traverse over the wheel outer surface 18, thereby enabling the wheel 12 to drive the belt 14, as discussed above and in further detail below.

Referring to Figs. 2 and 3, each projection 30 preferably includes an elongated strengthening bar 46 disposed within the prismatic body 29 and providing the majority of the cog's volume and mass. Each bar 46 is arranged so as to extend laterally across the belt inner surface 28 and generally perpendicularly with respect to the belt edges 24A, 24B, so that opposing bar ends 46a, 46b are disposed proximal to a separate one of the track surfaces 32, 33, respectively. Further, each projection 30 is preferably integrally formed with the belt body 40, with the bars 46 being encased within the material of the body 40 and the remainder of the projection 30, such that the belt 14 is generally of one-piece construction. Preferably, the bars 46 are formed of a relatively hard material, such as metal or a hardened polymeric material, and are most preferably formed of low carbon steel.

Although the projections 30 are each preferably formed as described above, each projection 30 may be formed in any other appropriate manner that enables the wheel 12 to drive the belt 14 as generally described herein. For example, each projection 30 may be formed as a generally triangular prism, a semi-cylinder, or any other appropriate shape that enables the projections 30 to engage with the wheel openings 20 (no alternatives shown). Further for example, each projection 30 may alternatively be formed as two or more projections (not shown) spaced transversely across the belt width w_B, as opposed to a single transverse projection as described above. As yet another example, the projections 30 may each be fabricated as a solid body 29 without the strengthening bars 46. As an even further

example, the projections 30 may each be formed as a separate component that is fixedly (e.g., by rivets) or removably attached (e.g., by threaded fasteners) to the belt inner surface 28, such removable attachment enabling replacement of any projections 30 that may become damaged.

Referring now to Figs. 1 and 4, the drive wheel 12 preferably includes a generally cylindrical body 50 having a longitudinal axis providing the central axis 15 and a generally circumferential outer surface 54 enclosing the axis 15. The drive wheel 12 is preferably rotatable in opposing directions about the axis 15, i.e., clockwise "CW" or counterclockwise "CCW" as indicated in Fig. 2, but may be configured to rotate in only a single direction CW or CCW. Preferably, the body 50 includes a plurality of elongated, generally axially-extending projections, most preferably teeth or splines 56, extending radially outwardly from, and spaced circumferentially about, the body outer surface 54. Each spline 56 has two opposing, generally rectangular radial surfaces 58, which each provide one wheel drive surface 21 (as discussed above), and a generally rectangular, outer circumferential surface 59, the surfaces 59 of all the splines 56 collectively forming the wheel outer surface 18.

By forming the wheel 12 with the splines 56, each wheel opening 20 is defined by a separate pair of adjacent splines 56. More specifically, each spline radial surface 58 is spaced from another, facing radial surface 58 of an adjacent spline 56 by a distance or width w_O (Fig. 5) that is slightly larger than the width w_C of the belt projections 30, the pair of facing radial surfaces 58 defining or bounding one of the wheel openings 20. Depending upon the direction of rotation (i.e., CW or CCW) of the drive wheel 12, one radial surface 58 of each spline 56 functions as a drive surface 21 and "pushes" against the contact surface 31 of each projection 30 that enters the bounded wheel opening 20, thereby linearly displacing the projection 30. Rotation of the drive wheel 12 causes the drive splines 56 to continuously contact and push against the projections 30 of the belt portion instantaneously disposed about the wheel outer surface 18, thereby driving the belt 14 to continuously circulate generally along the centerline 23.

Further, the drive wheel 12 also preferably includes a pair of shaft portions 51 extending outwardly from opposing axial ends 53 (one shown) of the body 50 and generally along the axis 15. Each shaft portion 51 is engageable with a separate one of a pair of frame mounting plates 67, as discussed below, so as to rotatably connect the drive wheel 12 with the frame 38. Furthermore, one of the two shaft portions 51 is connected with a drive unit 13, such as an electric or hydraulic motor, a detailed description of which is beyond the scope of the present disclosure. Preferably, the drive unit 13 is operatively coupled with the drive

wheel 12 and is configured to drive the wheel 12 in a first direction (e.g., CW) and to alternatively drive the wheel 12 in a second, opposing direction (e.g., CCW), such that the wheel 12 is alternatively rotatable about the axis 15 in the opposing directions CW or CCW, as indicated in Fig. 2. As such, the conveyor assembly 10 is capable of transporting material M in either linear direction R or L along the transport axis 25. With the wheel 12 being reversibly driveable, both opposing radial surfaces 58 of each drive spline 56 are engageable with the belt cog contact surfaces 31 to drive the belt 14, the particular spline surface 58 functionally contacting the belt projections 30 at any given time depending on the direction of wheel rotation (i.e., CW or CCW).

Although the above-described structure is presently preferred, the drive wheel 12 may be formed in any other appropriate manner. For example, the drive wheel 12 may be constructed as a cylindrical body with a plurality of generally rectangular recesses forming the wheel openings (not shown). Further for example, the drive wheel 12 may be formed by a pair of axially spaced circular plates or annular rings and a plurality of bars extending between the plates/rings, such that each wheel opening 20 is defined by each adjacent pair of bars (not shown). The scope of the present invention includes these alternatives and all other appropriate structures of the drive wheel 12 that enable the conveyor assembly 10 to function generally as described herein.

Referring particularly to Fig. 2, the conveyor assembly 10 preferably further comprises another wheel 60 spaced from the drive wheel 12 along the conveyor centerline 11 and rotatably connected with the frame 38. The other wheel 60 is disposed within the interior space S_I of the belt 14 such that the belt 14 is disposed about or encircles both of the two wheels 12 and 60. The other wheel 60 is constructed generally identically to the drive wheel 12, but is configured to function as an "idler" wheel, such that the wheel 60 rotates about its axis 15 by action of the driven belt 14. However, the other wheel 60 may alternatively be configured to be driven by the same drive unit 30 (e.g., through a chain) or by another drive unit (none shown). Further, the other/idler wheel 60 may alternatively be formed in any other desired appropriate manner, such as for example, as a generally cylindrical wheel having a substantially smooth outer circumferential surface (i.e., without projections or splines).

Referring now to Figs. 1 and 7, the frame 38 preferably includes a generally rectangular body 64 including the longitudinally spaced frame ends 40A, 40B and a pair of opposing sides 65A, 65B extending between the ends 40A, 40B. The body 64 further has an upper surface 66 and a lower surface 68, the two surfaces 66, 68 facing in generally opposing directions. More specifically, the upper surface 66 faces generally toward proximal portions

of the belt inner surface 28 disposed above the frame 38, such belt portions being engaged in transporting material during conveyor operation. Further, the lower surface 68 faces generally toward proximal portions of the belt inner surface 28 moving beneath the frame 38 along a "return" path during conveyor operation. Preferably, the frame body 64 is formed as a skeletal frame or truss constructed of a plurality of attached-together structural members 63, such as beams of bars. Alternatively, the frame body 64 may be formed of a plurality of attached-together plates so as to be configured as a generally rectangular box, of a combination of plates and bars of any appropriate shape, as one or more generally solid blocks, or in any other appropriate manner that enables the conveyor assembly 10 to function as described herein.

As best shown in Fig. 2, the frame 38 also preferably includes two pairs of mounting plates 67 (only one shown), each pair of plates 67 being disposed proximal to a separate one of the frame ends 40A or 40B. Each plate 67 includes a bearing opening (not indicated) configured to rotatably support one shaft portion 51 of the proximal one of the two wheels 12 or 60. Further, one of the two plates 67 located proximal to the drive wheel 12 provides an outer mounting surface 67a, the drive unit 13 being preferably removably connected with the surface 67a by appropriate means (e.g., threaded fasteners). Furthermore, the pair of plates 67 connecting the idler wheel 60 with the frame 38 are preferably configured such that the wheel 60 is adjustably positionable along the conveyor centerline 11, for example by providing a slotted opening (not shown) through each plate 67 into which the wheel shaft portions 51 are disposed. With this arrangement, the idler wheel 60 may be moved toward the drive wheel 12 to facilitate mounting the belt 14 about the two wheels 12 and 60, and then away from the drive wheel 12 to provide tension in the belt 14 to positively retain the belt 14 on the assembly 10.

Preferably, the frame 38 also includes at least four guard members 69 attached to the frame upper and lower surfaces 66, 68, respectively. More specifically, two guard members 69 are mounted to each one of the two frame surfaces 66 and 68 and are each located proximal to a separate one of the frame sides 65A or 65B. Preferably, each guard member 69 is formed of an "L" or angle beam and is each configured for mounting and protecting a separate rail member, as discussed in further detail below.

Referring to Figs. 5 and 7, the conveyor assembly 10 preferably further comprises at least another support rail 17 connected with the frame 38 and having an elongated body 35 and a plurality of roller wheels 14 contactable with the other belt track surface 33. The two support rails 16 and 17 are spaced laterally apart across the frame upper surface 66 so as to be

disposed on opposing sides of the conveyor centerline 11. Preferably, the two support rails 16, 17 are attached to the frame upper surface 66, but may alternatively each be connected to a separate frame side 65A, 65B, respectively, and positioned so that the rollers 34 extend at least partially above the upper surface 66. Further, the conveyor assembly 10 preferably also comprises at least one and most preferably two other, "lower" support rails 19, 21 connected with the frame 38 and each having an elongated body 35 and a plurality of rollers 34. The lower rails 19 and 21 are spaced apart so as to be located on opposing sides of the conveyor centerline 11 and are each connected with the frame 38 such that the rollers 34 of the lower rails 19, 21 extend or project at least partially below the frame lower surface 68. As such, the rollers 34 of each rail 19, 21 contact portions of the belt track surfaces 32, 33, respectively, moving beneath the conveyor frame 38 in a "return path". Preferably, the lower support rails 19, 21 are each attached to the frame lower surface 68, but may alternatively be connected with a separate side 65A, 65B of the frame 38.

Referring to Figs. 5-7, the four support rails 16, 17, 19 and 21 are preferably generally identically constructed as described above and in further detail below, but may alternatively be constructed in any other appropriate manner. More specifically, the rail body 35 of each support rail 16, 17, 19 or 21 is preferably formed as an elongated channel member 70 into which each of the rollers 34 is rotatably mounted, as described below. The channel member 70 has opposing ends 70a, 70b and a longitudinal centerline 71 extending between the ends 70a, 70b, the member 70 having a sufficient length such that each end 70a, 70b is disposed proximal to a separate one of the frame ends 40A, 40B, respectively. Preferably, the channel member 70 is formed of a pair of spaced-apart sidewalls 72 disposed on opposing sides of the centerline 71 and a base wall 73 extending between and connecting the sidewalls 72. The sidewalls 72 form an elongated, open channel 74 into which the rollers 34 are partially disposed, as discussed below. Preferably, the channel member 70 is provided by a "C" or "U" shaped beam or "channel iron" structural member having the walls 72 and 73 integrally formed, but may alternatively formed of two or more separate members appropriately attached together, such as two L-beams or angle iron or three flat plates.

Further, the rollers 34 each preferably include a circular cylindrical body 76 and a shaft 78 extending along the central axis 76a of the body 76 and having opposing axial ends 78a and 78b. Each roller 34 is mounted within the channel member 70 by rotatably connecting each shaft end 78a, 78b with a separate one of the sidewalls 72 such that the body 76 is partially disposed within the channel 74 and partially extends outwardly from the channel 74. Further, the rollers 34 are each arranged such that the associated roller shaft 78

extends generally perpendicularly across the rail centerline 71 and are spaced apart axially along the centerline 71 by a generally equal distance d_R (Fig. 6). Most preferably, each roller body 76 has an outer diameter D_O (Fig. 7) in the range of between about two inches and three inches, with the spacing distance D_S having a value between about four inches and six inches. Further, the roller bodies 76 each preferably have an axial length l_A (Fig. 6) of about three inches, such that the width w_T of each track section 32 and 33 is preferably slightly greater than three inches. However, the rollers 34 may be formed having any appropriate size and/or may be spaced apart by any appropriate distance d_R and the scope of the present invention is in no manner limited to any particular construction or arrangement of the rollers 34.

Preferably, the support rails 16, 17, 19 and 21 each further includes an elongated base member 80 to which the channel member 70 is removably mounted. The base member 80 is preferably formed of a generally rectangular bar or beam having a generally flat, opposing first and second surfaces 81, 82, respectively. The channel member 70 is disposed against and removably mounted to the first or outer surface 81 by appropriate means, preferably by threaded fasteners or bolts 83 (only one shown). As such, the channel member 70 may be readily removed from the conveyor assembly 10 for purposes such as cleaning the assembly 10 or for replacing one or more rollers 34. Further, each base member 80 is attached to an appropriate location on the frame 38, as discussed above, so as to connect the associated support rail 16, 17, 19 or 21 with the frame 38. Specifically, the second or inner surface 82 of each base member 80 is disposed against an outer surface 69a of one of the guard members 69 and is preferably fixedly attached thereto, such as by weldment material, but may alternatively be removably connected therewith by means such as threaded fasteners (none shown). Furthermore, each of the support rails 16, 17, 19 and 21 is preferably formed as a single unit that includes one channel member 70 and one base member 80, each extending along substantially the entire length of the frame upper surface 66. However, any one or more (or all) of the support rails 16, 17, 19 and 21 may alternatively be formed of a plurality of sections, and thus a plurality of the members 70 and 80, spaced upon the frame 38 in directions generally along the conveyor centerline 11.

With the above construction, the conveyor assembly 10 generally functions as follows. The drive wheel 12 (or both wheels (not preferred)) is driven to rotate about the wheel central axis 52 in a desired direction CW or CCW, as indicated in Fig. 2. The rotation of the drive wheel 12 causes the wheel splines 56 to push against the projections 30 of the belt portions disposed about the wheel 12. The belt 14 is thereby caused to circulate about the two wheels 12 and 60 such that portions of the belt 14 displace along the frame upper

surface 66 in either the rightward direction R or the leftward direction L, as indicated in Fig. 2, generally along the transport axis 25. Material M deposited upon the belt outer surface 26, such as from another conveyor, a hopper or a dump truck (none shown), is transported in the particular direction R or L between two locations on the construction vehicle (not shown), such as between a hopper and an auger of a paver (none shown). As the belt 14 transports the material M, the track surfaces 32, 33 of the belt portions travelling over the frame upper surface 66 slide upon the upper roller rails 16, 17, respectively. Thus, the roller rails 16 and 17 support the weight W of the belt 14 and the paving material M during the transport process, as indicated in Fig. 7.

It will be appreciated by those skilled in the art that changes could be made to the embodiments described above without departing from the broad inventive concept thereof. It is understood, therefore, that this invention is not limited to the particular embodiments disclosed, but it is intended to cover modifications within the spirit and scope of the present invention as defined in the appended claims.